

IN THE CLAIMS:

Please amend the claims, as follows:

Claim 1 (currently amended): A system for optimizing the performance of a stepper motor by optimizing step-time sequence instructions given to the stepper motor, the system comprising:

a host computer having a user interface for entering commands to the stepper motor and defining a desired operation profile used to create initial step time sequence instructions; and

an interface computer connected between the host computer and the stepper motor having program means for executing a real-time controller program ~~containing an objective function and receiving~~ which receives real-time feedback from the stepper motor to obtain a measured operation profile for mathematically obtaining an objective function value and modifying the initial step time sequence instructions to produce optimized step time sequence instructions, so that the measured operation profile is modified to approach the desired operation profile ~~produce optimized step-time sequence instructions~~, the interface transmitting the optimized step-time sequence instructions to the stepper motor.

Claim 2 (original): The system of claim 1, further comprising feedback means connected with the stepper motor for providing real-time feedback to the interface computer.

Claim 3 (original): The system of claim 1, wherein the optimized step-time sequence instructions are transmitted to the stepper motor in real-time.

Claim 4 (original): The system of claim 1, wherein the objective function is modified by the real-time feedback when the real-time controller program executes.

Claim 5 (currently amended): An optimization system for a stepper motor, comprising:

a host computer for entering stepper motor commands defining a desired result operation profile;

an interface computer connected between the host computer and the stepper motor having program means for determining ~~comparing~~ an objective function result value ~~to the desired result~~, the program means minimizing the objective function result value to improve the dynamic performance of the system using a generated step-time sequence based on the desired result operation profile, the program means perturbing each time step and evaluating the objective function value for each perturbation to optimize the system response.

Claim 6 (currently amended): A method for optimizing operation of a stepper motor based on a desired operation profile, the method comprising:

providing an interface computer connected with the stepper motor;
generating an objective function ~~model~~ for optimizing a step-time sequence for the stepper motor;

loading an optimization program including the objective function ~~model~~ on the interface computer;

generating an initial step-time sequence for the stepper motor;

receiving, at the interface computer, feedback from hardware on the stepper

motor, the feedback containing ~~position data~~ a measured operation profile;

calculating a difference between the desired and measured operation profile;

applying a mathematical operation to the difference to obtain an objective function value; and

running the optimization program on the interface computer for determining perturbations to the step-time sequence instructions to minimize ~~a result from the an~~ objective function value model in response to the feedback to generate an optimized step-time sequence.

Claim 7 (new): A method according to claim 6, wherein running of the optimization program includes inputting the objective function value into an algorithm for determining perturbations to the step-time sequence instructions.

Claim 8 (new): A method according to claim 6, wherein the steps of receiving a measured operation profile, calculating a difference between the desired and measured operation profile, applying a mathematical operation to the difference to obtain an objective function value, and running the optimization program are repeated, so that the objective function value is minimized and the measured operation profile approaches the desired operation profile.

Claim 9 (new): A system for optimizing the performance of a stepper motor by optimizing step-time sequence instructions given to the stepper motor, the system comprising:

a host computer having a user interface for entering commands to the

stepper motor and defining a desired operation profile used to create initial step time sequence instructions; and

an interface computer connected between the host computer and the stepper motor having program means for executing a real-time controller program which receives real-time feedback from the stepper motor to obtain a measured operation profile for mathematically obtaining an objective function value which is input into an algorithm for determining perturbations to the step-time sequence instructions, wherein the real-time controller transmits optimized step time sequence instructions to the motor.

Claim 10 (new): A system according to claim 9, wherein the real-time controller program receives real-time feedback from the stepper motor to repeatedly obtain a measured operation profile for mathematically obtaining on a repeated basis an objective function value which is repeatedly input into an algorithm for repeatedly determining perturbations to the step-time sequence instructions, wherein the real-time controller transmits optimized step time sequence instructions to the motor.